Overview of MEDN Inventory and Monitoring Vital Signs Monitoring Programs
April 2011

Vital Sign	Parks where implemented	Initial year of data collection	Primary monitoring objectives	Overview of data collection methods	Program Leaders
Aquatic Amphibians	SAMO	2001	Determine the annual status and long-term trends in the distribution and occupancy of 4 native species and associated non-native invasive species	Stream surveys are conducted twice per season (spring-summer): one intensive survey and one to record presence/absence.	Katy Delaney (SAMO), Seth Riley (SAMO)
Deer Mouse	CHIS	1992	Determine the annual status and trends in the density of deer mice on Anacapa, San Miguel and Santa Barbara islands.	Trapping grids using mark-recapture techniques. Trapping grids consist of 10 rows of 10 Sherman traps. Grids are normally sampled twice each year during spring and fall seasons.	Tim Coonan (CHIS), Helen Fitting (CHIS)
Fresh Water Quality	SAMO, CHIS	2013	Determine status and trends in key stream water quality variables to (1) ensure that stream water quality is within the bounds designated for established beneficial uses, (2) provide correlative data for evaluating trends in amphibian populations, and (3) provide data-supported management recommendations for improving water quality in impaired streams.	Program in development. Coordinating with Southern California Coastal Waters Research Program/Regional Monitoring Program. In addition to standard water quality collection procedures, it is likely that we will implement a rapid assessment protocol to monitor stream physical condition. This protocol monitoring will compliment riparian vegetation monitoring.	Stacey Ostermann-Kelm (MEDN)
Invasive plants	CABR, SAMO, CHIS	2012	Provide early detection of targeted non-native plants and rapidly transmit information to managers	Program in development. Proposed data collection through native plant monitoring, targeted sampling of high-risk areas (trails and trailheads), and citizen science using smart phone applications.	Irina Irvine (SAMO), Keith Lombardo (CABR), Dirk Rodriguez (CHIS), Sarah Chaney (CHIS)
Island Fox	CHIS	1993	Determine annual survival and cause-specific mortality of island foxes on San Miguel, Santa Rosa and Santa Cruz islands.	Population size is estimated annually on each of the 3 island by extrapolating density from multiple small grids. Mortality monitoring is conducted via radiocollars.	Tim Coonan (CHIS)

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Kelp Forest Communities	CHIS	1982	Determine the status and health of the islands' kelp forests; determine status and long-term trends in the cover, relative abundance, and/or size class of 70 taxa or categories of algae, fish and invertebrates.	Quadrats, band-transects, random point contacts, visual fish transects, size frequency surveys, roving diver fish counts	David Kushner (CHIS)
Landbirds	CHIS	1993	Determine status and long-term trends in density and abundance of breeding birds by species during the breeding season.	Point counts using distance sampling during the breeding season. Protocol is currently being revised for publication in September 2011.	Tim Coonan (CHIS), Linda Dye (CHIS)
Landscape Dynamics	CABR, SAMO, CHIS	2012	Program in development. Preliminary monitoring objectives are to determine status and trends in phenology at the landscape scale (using MODUS products), fragmentation, changes in landcover type, and vegetation mapping.	Geographic information systems, aerial photography, MODUS, Fragstats.	Lena Lee (MEDN)
Marine Water Quality	CABR, CHIS	2013	Determine the status and trends in marine water quality surrounding the park. More specifically, determine whether contaminates in marine waters are in sufficient concentrations to impact intertidal biota and designated uses of these waters.	Program in development.	Stacey Ostermann-Kelm (MEDN), Benjamin Pister (CABR), Dan Richards (CHIS)

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Native Plant Communities	CABR, SAMO, CHIS	CHIS (1984), CABR (2004), SAMO (2012)	Determine long-term changes in distribution and abundance of vegetation communities. Determine status and trends in species composition and abundance in vegetation communities. CHIS monitors 22 vegetation types. CABR monitors the coastal sage scrub community. SAMO will monitor 5 broad community groups: chaparral, coastal sage scrub, grasslands, oak woodland, and riparian habitat.	At CHIS, 183 permanent transects have been established on five islands and are monitored annually. Species are recorded every 30 cm along a 30 meter transect line. CABR uses point-intercept transects and transects are not permanent - new transects are randomly located each year. SAMO will used a combination of techniques depending on the community type.	Keith Lombardo (CABR),John Tiszler (SAMO), Dirk Rodriguez (CHIS)
Pinnipeds	CHIS	1987	Estimate trends in abundance of California sea lions, northern elephant seals, harbor seals, and northern fur seals	Ground counts to measure pup production. Aerial photography used to determine the number of adults and distribution of rookeries and hauling sites. The National Marine Fisheries Service is conducting this monitoring.	Kate Faulkner (CHIS), Dan Richards (CHIS)
Rocky Intertidal Communities	CABR, CHIS	CHIS (1982), CABR (1990)	Determine long-term trends in percent cover of key sessile organisms in the rocky intertidal ecosystem.	Thirteen key species or assemblages are monitored twice per year at 21 sites on the 5 CHIS islands and at 6 locations in the 3 management zones at CABR. The methods used by both parks are consistent with MARINe.	Dan Richards (CHIS), Benjamin Pister (CABR)
Sand Beaches & Lagoons	CHIS	1993	Estimate trends in abundance of sand crabs, beach hoppers, olive snails, and Pismo clams. Determine annual reproductive phenology and productivity of sand crabs. Determine abundance of beach wrack available to community organisms. Determine physical cycles of the coastal lagoons at Santa Rosa Island.	A variety of sampling techniques are used: point contact transects, clam gun transects, band transects and trench transects. Pismo clam populations are estimated with mark-recapture techniques.	Dan Richards (CHIS)

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Sea Birds	CHIS	1988 (varies by species)	Detect changes in abundance and distribution of 6 breeding seabirds: double-crested and pelagic cormorants, California brown pelicans, western gulls, Xantus' murrelets, and Cassin's auklets over time. Where feasible, use productivity, survivorship, food habits and growth rates as indicators of population changes.	Counts of incubating birds, pairs at nest sites, young at nest sites and number of nests are used to estimate abundance. Reproductive success is determined through counts of chicks and brood size. Direct observation is used to estimate phenology. Counts of individuals based on plumage and band sightings are used to determine population age structure.	Laurie Harvey (CHIS)
Terrestrial Herpetofauna	CABR, SAMO, CHIS	CABR (1995), SAMO (2001), CHIS (1993)	Determine long-term trends in terrestrial reptile and amphibian diversity, distribution, and relative abundance.	CABR and SAMO use pitfall trap arrays supplemented with snake traps. CHIS uses a series of coverboards along 6 permanent transect lines. Protocol is currently being revised.	Katy Delaney (SAMO), Seth Riley (SAMO), Kaye London (CABR), Tim Coonan (CHIS), Helen Fitting (CHIS)
Weather and Climate	CABR, SAMO, CHIS	2010 for new protocol, CHIS protocol published in 2009	A protocol that covers all 3 parks and aims to provide summary climate information is in development. Preliminary objectives are to use a data-harvesting approach to determine status and trends in precipitation, temperature, and wind for the 3 network parks. Current CHIS monitoring objectives are to record up-to-the minute weather conditions using 4 remote automated weather stations on the 4 islands (Anacapa, Santa Cruz, Santa Rosa, Santa Barbara) and to record daily weather conditions manually at 6 locations on 5 islands.	RAWS stations and ranger weather stations on the Islands. A combination of stations (COOP, RAWS, Scripps, etc) at SAMO and CABR.	Paula Power (CHIS), Stacey Ostermann-Kelm (MEDN)

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